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U.S. Department
of Transportation

**Federal Highway
Administration**

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NATIONAL MODEL

Statewide Application of Data Collection and Management Technology to Improve Highway Safety

BACKGROUND

Transportation and public safety agencies are under pressure to protect the public by improving safety with fewer resources. Increasingly, the agencies that are involved in transportation safety are finding that they can improve performance by working together and sharing information. The National Model is a partnership between the Federal Highway Administration (FHWA) and the State of Iowa to demonstrate the successful integration of technologies for data collection, management, and communication of safety information. The objectives of the National Model are to improve data acquisition for roadway incidents, leverage proven technology for law enforcement, streamline the communication of safety information to key stakeholders, and enhance the use of this information for safety programs. New approaches are being used to shorten data collection time, minimize disruption to traffic, increase officer safety and efficiency, and improve data quality.

The State of Iowa is a model for the Nation in how agencies work together to define new business processes and streamline the flow of safety information. Rather than duplicating efforts or developing incompatible solutions at the State level, Iowa agencies use an integrated approach to safety management. The two primary agencies, the Iowa

Department of Transportation (Iowa DOT) and the Iowa Department of Public Safety (Iowa DPS), have worked together closely for the successful application of technologies. Iowa DOT leads the efforts involving computer hardware and software technology and Iowa DPS leads the communications component, which makes use of the State's fiber-optics network. Fiber-optics make it possible to move high volumes of data and images. The benefits of Iowa's integrated approach to safety management include:

- Reduction in the overall effort necessary to collect relevant data.
- Electronic data acquisition and dissemination of timely and accurate incident information.
- Common access among agencies to vital incident information, including persons involved, severity, weather conditions, and location.
- Data transmission and feedback with the court system for citation information and adjudication results.
- Maturity in the use of analytical tools.

SHARING THE IOWA EXPERIENCE

Iowa is actively sharing their experiences with other State and local agencies and providing the technical assistance necessary to enhance these other agencies' public safety information systems. Direct visits by Iowa staff have been made to many States. In December 1998, 9 States were represented at a National Model Workshop.

STATUS OF NATIONAL MODEL ACTIVITIES

An integrated set of electronic forms has been developed that shares data among all forms, eliminating duplicate entries and providing for immediate electronic transmission to remote files at both the State and local levels. The forms include:

- Crash reports (including on-site driver information exchange).
- Commercial vehicle inspections.
- Citations.
- Drunk driving reports.
- Incident reports.

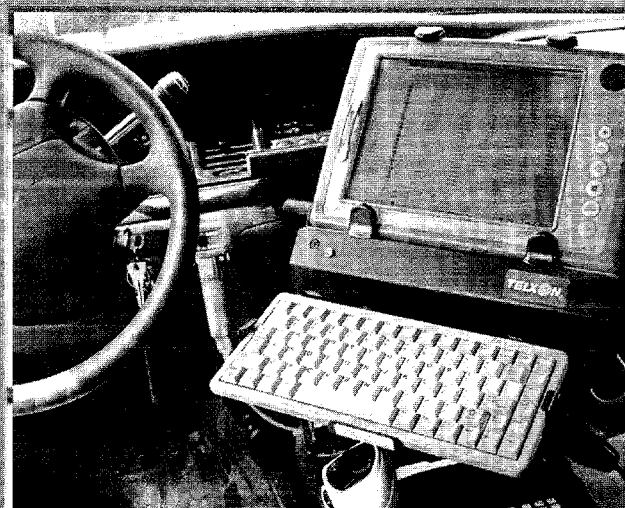
In using this suite of electronic forms, Iowa takes advantage of the following technologies:

- Pen-based computers.
- Portable printers.
- Bar code readers.
- Digital cameras.
- Global Positioning Systems (GPS).
- Geographical Information Systems (GIS).

Other technologies will be examined, including laser measuring devices and voice recognition.

GIS—AN IMPORTANT TOOL

Crash analysis software specifically developed to meet the needs of engineers and enforcement personnel has been used for several years, but there was a desire to develop Geographical Information Systems (GIS) analysis and "smart map" tools so that results could be geographically displayed. Historical crash records were referenced with a link-node system and the roadway data was referenced to a roadway-segment system. By relating both files to an x, y coordinate system, the data could be integrated and displayed using GIS. The GIS analysis software has been developed and the crash data collection software discussed above generates a file that directly interfaces with it. This interface has made it possible to populate some of the crash report elements without asking the officer to enter them. Those elements include items such as road-surface type, locality, type of traffic way, speed limit, road class, route number/name, milepost, and roadway geometrics.



Mobile pen-based computers facilitate onsite data collection for highway incidents.

Law enforcement officer scans license with bar code reader to capture driver and vehicle information.



MAJOR ACTIVITIES PLANNED FOR 1999 AND 2000

GPS Dispatch

The Department of Justice and the Federal Transit Agency each has active Global Positioning Systems (GPS) dispatch projects in Iowa. One project involves 100 enforcement, fire, and other emergency vehicles in one urbanized county. The other project involves a rural IO-county transit operation that is interested in sharing GPS dispatch with enforcement, fire, and other emergency vehicles. The National Model project is cooperating with both efforts.

Advanced Law Enforcement Response Technology (ALERT) Vehicles

ALERT is a state-of-the-art law enforcement vehicle that uses electronic technology for a wide array of enforcement activities, including wireless communication; accident and traffic enforcement reporting; and pinpointing real-time location of accidents and other roadway hazards via GPS. The ALERT system also uses digital cameras to collect images from the crash scene and can merge these images with the crash report. ALERT technology integrates communications, i.e., voice, data, and video information, among response

vehicles and back to a center without regard to each agency's internal communications system. The ALERT system offers an excellent opportunity for the National Model project.

Crash Outcome Data Evaluation System (CODES)

The National Highway Traffic Safety Administration started a CODES project through the Iowa Department of Public Health. Crash, ambulance, and health care records are being linked to provide a more complete picture of the severity of crashes.

American Association of State Highway Transportation Officials (AASHTO) Traffic Safety Information Management System (TSIMS) Project

The National Model staff continues to coordinate with AASHTO on their safety data initiatives. AASHTO is planning to develop shareware as part of their TSIMS project to provide integration of legacy data systems within a State, external systems, and possibly across political subdivision or agency boundaries. Support is being provided to AASHTO so that complementary software is developed.

Partnerships

The State of Iowa is looking for additional partners to join the consortium. These new partners will assist in new developments and enhancements, operation of a multi-State help desk, and maintenance of software.

For more information, contact:

Terry Dillinger

Director of Driver Services

Motor Vehicle Division

Iowa Department of Transportation

Telephone: (515) 237-3153

www.state.ia.us/government/dot/national.htm

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